Guidelines for Determination of Rangeland and Pinyon-Juniper Ecological Sites

Soil taxonomic units identified during the course of soil surveys completed by the Natural Resources Conservation Service (NRCS) in Nevada are correlated to rangeland or forest land ecological sites as appropriate. Rangeland and forest land sites are ecological subdivisions of natural landscapes that are separated in terms of the historic climax (original or natural potential) plant community they are capable of supporting. Forest land ecological sites are assigned to units of vegetation where the historic climax plant community is dominated by a tree overstory. Rangeland ecological sites are recognized on rangelands where tree production is not significant within the historic climax plant community.

The natural plant community that existed prior to European immigration and settlement in North America is the *historic climax plant community*. Part 600.0301(d) of the NRCS National Range and Pasture Handbook, describes the historic climax plant community as being in "dynamic equilibrium" with its (biotic and physical) environment–"it is the steady state plant community that was able to avoid displacement by the suite of disturbances … that naturally occurred within the area occupied by the site. Natural disturbances, such as drought, fire, grazing of native fauna and insects, were inherent in the development and maintenance of the (historic climax) plant communities. Plant communities that are subjected to abnormal disturbances and physical site deterioration or that are protected from natural influences, such as fire and grazing, for long periods seldom typify the historic climax vegetation."

The relatively recent (±150 years) expansion of juniper and pinyon from original forest land communities onto adjacent rangelands has presented problems to many of those attempting to classify present vegetation in relation to the natural potential vegetation and to correlate the occurrence of the presumed climax vegetation to specific environmental factors. Increases in tree density of original juniper-pinyon stands have occurred in addition to the invasion of adjoining sagebrush-grass rangelands. These successional changes have been attributed to various factors including overgrazing by livestock, climatic changes, and suppression of wildfire. There is considerable debate as to which of these factors is most significant in explaining an obvious increase in the land area occupied by pinyon and juniper.

For many areas of juniper-pinyon occurrence, the distinction between forest land and rangeland potential communities is very subtle. Soil-vegetation correlations made in these transition areas have often been more an assessment of the management implications presented by these trees occupying a given landscape than an evaluation of natural environmental factors. Classification of climax vegetation as either rangeland or forest land does not dictate management for classified units. The natural potential plant community for a site related to present vegetation on the site merely represents one kind of inventory information to be considered by land managers in developing management strategies for the site.

In the absence of definitive studies that relate the presence of juniper and/or pinyon trees to specific environmental factors, the NRCS has developed criteria to be used in the classification of pinyon and juniper plant communities and adjacent rangelands. The following key to separating rangeland and forest land sites represent criteria to be used by NRCS personnel in completing soil-site correlations in Nevada for areas of juniper-pinyon forest land/rangeland transition.

KEY TO SEPARATING RANGELAND POTENTIAL SITES FROM JUNIPER AND/OR PINYON FORESTLAND POTENTIAL SITES IN AREAS OF RANGELAND–FORESTLAND TRANSITION

1. Stand of juniper and/or pinyon trees present on site.
    2. Presence of "mature potential" (more than 150-years old) juniper and/or pinyon within the stand.
        3. Present canopy cover of "mature potential" trees within the stand is greater than 25 percent …………………………………………………………………………………………….... **Forestland Ecological Site**
        3. Present canopy cover of "mature potential" trees within the stand is less than 25 percent.
            4. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an overstory canopy cover greater than 25 percent ……………………………………………………………..… **Forestland Ecological Site**
            4. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents *does not exist* that reasonably suggests the site once supported a stand of "mature potential" trees with an overstory canopy cover greater than 25 percent.
                5. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an average stand height of less than 12 feet …..…………………….……..…..…. **Rangeland Ecological Site**
                5. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an average stand height of 12 feet or greater.

KEY TO SEPARATING RANGELAND POTENTIAL SITES FROM JUNIPER AND/OR PINYON FORESTLAND POTENTIAL SITES IN AREAS OF RANGELAND–FORESTLAND TRANSITION -continued

6. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an overstory canopy cover greater than 15 percent **…… Forestland Ecological Site**

6. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an overstory canopy cover less than 15 percent **…… Rangeland Ecological Site**

2. Individual juniper and/or pinyon trees within the stand are all less than 150-years old.

7. Topographic and/or soil features of the site limit the frequency and intensity of natural fire. Soils are typically very shallow, rocky and droughty, and are often associated with area of exposed bedrock. Some soils are shallow over soft bedrock with eroded surface horizons. Potential for production of continuous fine fuels (including litter) is less than 600 pounds per acre.

8. Present stand of trees (in the absence of disturbance) is expected to progress to a stand of juniper and/or pinyon more than 150-years old with an overstory canopy of greater than 25 percent. **……..Forestland Ecological Site**

8. Present stand of trees (in the absence of disturbance) is expected to progress to a sparse stand of juniper and/or pinyon more than 150-years old with an overstory canopy of less than 25 percent.

9. Present stand of trees (in the absence of disturbance) is *not* expected to achieve an average stand height of 12 feet **…… Rangeland Ecological Site**

9. Present stand of trees (in the absence of disturbance) is expected to achieve an average stand height of 12 feet or greater.

10. Present stand of trees (in the absence of disturbance) is expected to progress to a stand of juniper and/or pinyon more than 150-years old with an overstory canopy of greater than 15 percent. **……Forestland Ecological Site**

10. Present stand of trees (in the absence of disturbance) is expected to progress to a stand of juniper and/or pinyon more than 150-years old with an overstory canopy of less than 15 percent. **……...Rangeland Ecological Site**

7. Topographic and/or soil features of the site do not restrict natural fire. Soil surface relative free of large rock fragments or high amounts of gravels. Residual and colluvial soils are typically more than 14 inches deep. Includes most non-eroded alluvial soils. Potential for production of continuous fine fuels (including litter) is greater than 600 pounds per acre. **…….. Rangeland Ecological Site**

1. Juniper and/or pinyon trees not present on site.

11. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an overstory canopy cover greater than 25 percent. Topographic and/or soil features limit the frequency and intensity of natural fire on the site. **…… Forestland Ecological Site**

11. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site has never supported a stand of "mature potential" trees with an overstory canopy cover greater than 25 percent. Topographic and/or soil features do not limit the frequency and intensity of natural fire on the site.

12. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an average stand height less than 12 feet. **…… Rangeland Ecological Site**

12. Physical evidence of "mature potential" juniper and/or pinyon tree removal by harvest, fire, or other agents that reasonably suggest the site once supported a stand of "mature potential" trees with an average stand height of 12 feet or greater.

13. Present stand of trees (in the absence of disturbance) is expected to progress to a stand of juniper and/or pinyon more than 150-years old with an overstory canopy of greater than 15 percent. **……Forestland Ecological Site**

13. Present stand of trees (in the absence of disturbance) is expected to progress to a stand of juniper and/or pinyon more than 150-years old with an overstory canopy of less than 15 percent. **…… Rangeland Ecological Site**